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Rose Technic Staff
Rose-Hulman Institute of Technology

Rose Technic

MEMBER ENGINEERING COLLEGE MAGAZINES ASSOCIATED

APRIL, 1950

"...just drive straight ahead for 37,681 miles"

ALMOST everywhere you travel across this land of ours, you roll over beautiful wide, straight, smooth roads. A magnificent plan of interstate highways, the greatest road program in American history, is taking form at the rate of 700 million dollars worth of construction per year.

37,681 miles of swell driving . . . direct travel from any part of the country to any other part . . . routes north and south, east and west, and diagonal routes as well . . . big highways directly serving practically all cities of 50,000 population or more.

This is part of the better America that our generation is building. It's taking plenty of brains. Plenty of man power. Lots of cement. And lots of *Steel*.

It's a job that's far from finished, though. And it's going to call for an even greater supply of each of these commodities. Trained engineers must plan and build the highways of the future. And the talents of countless other skilled men will go into the manufacture of the cement and steel for the job.

Knowing that progress depends on people, United States Steel is looking ahead. Promising young men, training for careers in the steel industry, are daily tackling problems and developing ideas which will create new steels and new uses of steel for better living. The achievements of these young men not only help keep United States Steel in the vanguard of the industry but provide opportunity for building fundamental qualifications for leadership.

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USS

UNITED STATES STEEL

Rose Technic

VOLUME LXI, NO. 7 APRIL, 1950

In This Issue

Cover

Another of the great engineering accomplishments is the covering of the United States with a network of pipelines. These pipelines convey everything from natural gasses to sluggish crude oils. Pictured here is the crossing of a mountain range with a pipeline. Plates by courtesy of International Harvester Company.

Frontispiece

Largest twin-drive electric motor unit for the steel mill industry is readied for final testing. Consisting of two 4,000 horsepower motors, the unit is part of a major conversion to electrical drive equipment.

PHOTO CREDITS: Frontispiece—WESTINGHOUSE ENGINEER. Page 8, E. I. du PONT de NEMOURS & COMPANY, INC. Page 9, SOHIOAN. Page 10, AIR FORCE. Page 13, ROSE TECHNIC. Page 16, THE SCIENTIFIC MONTHLY. Page 20, ROSE TECHNIC.

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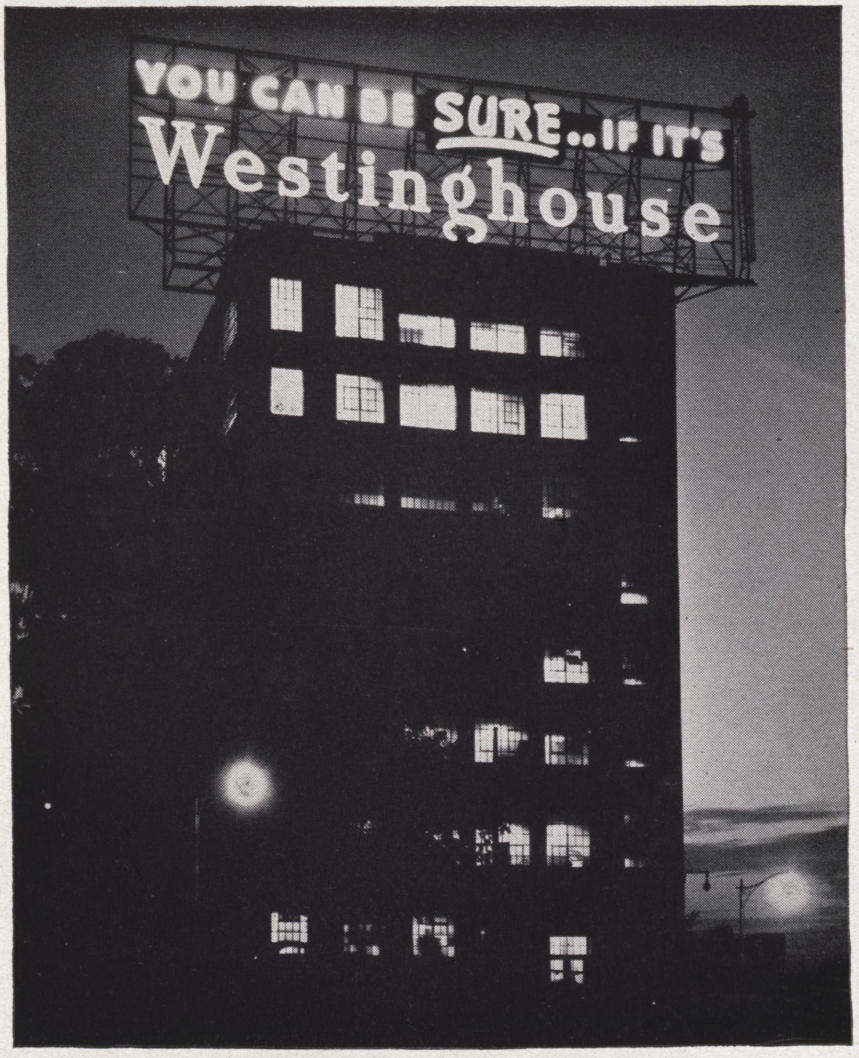
A Name to Remember



Tomorrow . . . when you start playing for keeps . . . names will assume new importance. Reputations are built on ability to produce . . . effectively . . . efficiently . . . economically . . . built on results delivered.

Since its inception, Westinghouse has recognized this principle . . . has been guided by this premise in each of the thousands of undertakings it has initiated.

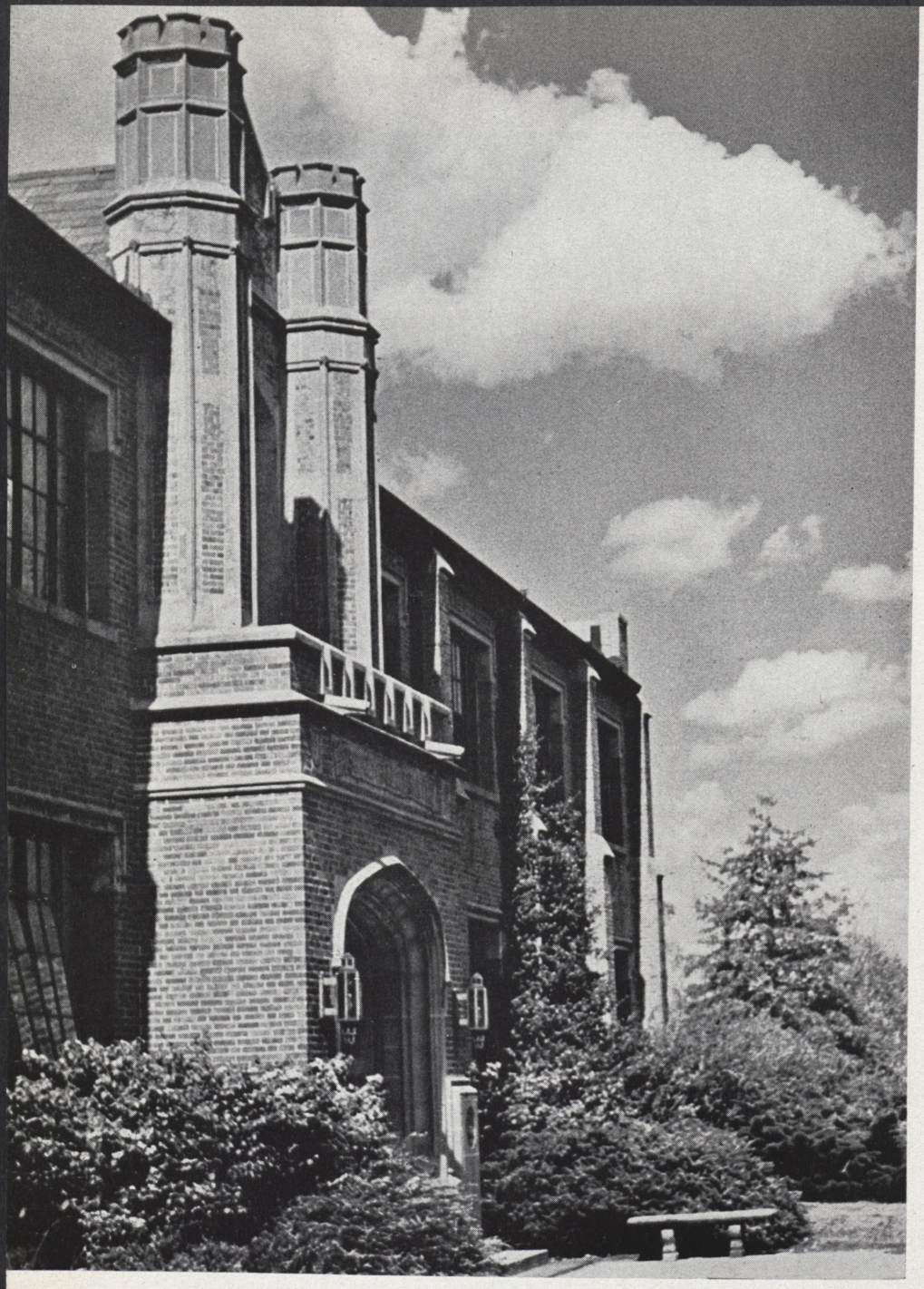
In the university, where your work is judged on thoroughness and accuracy, you have learned to rely on Westinghouse laboratory equipment.

As you enter business, you will learn that this great name in engineering and industry will mean even more to you.

Whether your success is at stake in the college laboratory or in the business world, the broad experience and established reputation for excellence in engineering and manufacturing that Westinghouse has built through the years will be available to you.

As you enter industry, you will meet new problems that will bring you in contact with many types of products, processes and methods. Because Westinghouse products play a vital role in practically every industry, our paths will likely cross many times. We will always welcome the opportunity to serve you . . . guided by uncompromising principles . . . principles that are required to fulfill the commitment . . .

YOU CAN BE SURE . . IF IT'S Westinghouse



HIGH SCHOOL GRADUATES:

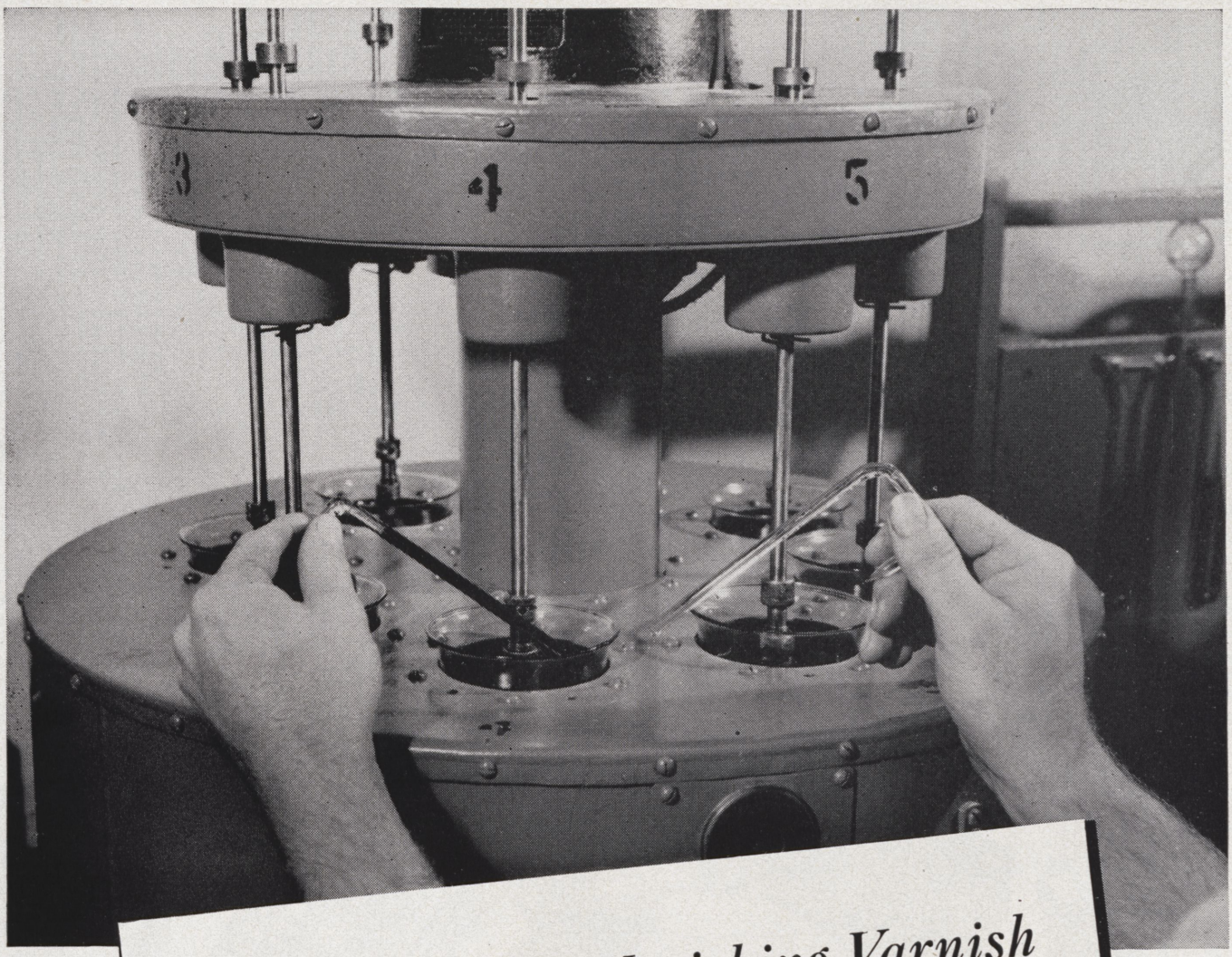
You are cordially invited to visit Rose Polytechnic Institute, to learn more about your college entrance and the engineering courses available to you at Rose.

NOBLE C. BLAIR

Admissions Counselor

ROSE POLYTECHNIC INSTITUTE

TERRE HAUTE, INDIANA



The Case of the Vanishing Varnish

VARNISH PAINTS a grim picture inside an engine. Oxidation of motor oil under operating conditions is largely responsible for varnish accumulations which result in sticking rings and valves, sluggish pistons, loss of power.

The varnish problem, however, has been all but conquered by Standard Oil lubricants. Today our heavy-duty and premium-type oils contain additives—oxidation inhibitors plus detergents that keep engines cleaner, keep them running longer and enable them to deliver more power.

We learn about these additives and what they will do by subjecting our oils to a variety of tests. For example, we devised the Indiana Stirring Oxidation Test (which is performed on the machine in the picture) to provide data that would help solve the varnish problem. It is helping solve that problem. Other tests are leading to other improvements.

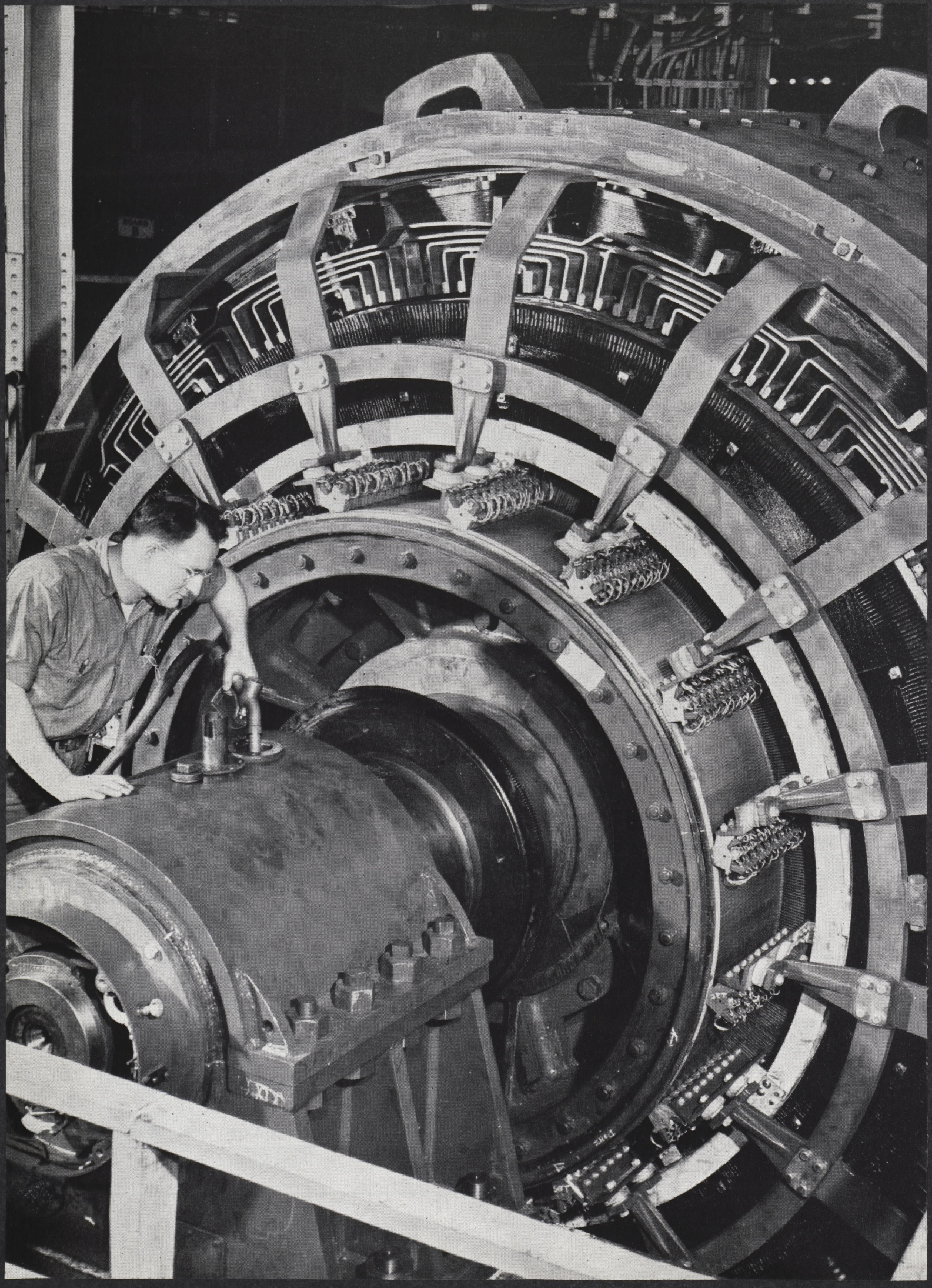
• • •

Behind all the tests are the men of Standard Oil. It is their obligation never to be satisfied —to believe that improvements are not only possible but necessary. Thus they maintain this company's leadership in research, and help provide our customers with products that steadily increase in quality and usefulness.

Standard Oil Company

(INDIANA)

STANDARD



Pipe Line Perplexities

By Fred Reynolds, jr., m.e.

It is doubtful whether most people realize that the United States has a network of oil pipelines totaling 140,000 miles—enough to wrap around the earth five times. These pipelines are essential to the country's producers as well as to its refineries. Their facilities are usually made available to every producer as soon as a new field has been proved. About all the pipeline equipment that most people ever see is the enormous terminal tanks and the relatively few pumping stations.

In pointing to total tonnage handled, the pipeline industry is the third largest freight carrier in the country; its cargoes of bulk oil and products comprise one-ninth of all of the freight tonnage moved in the United States.

The extension of pipelines into newly-proven fields and between refineries and marketing areas is a continuous operation because new fields are constantly being discovered and market demands are increasing greatly. A great variety of problems confront the engineers in the installation of a new pipeline.

Most experienced pipeliners agree that laying pipelines on ground, though no simple procedure, does not compare in difficulty with planting them beneath the water. The laying of pipe underwater involves an application of an extra series of layers of special protective insulation to prevent corrosion. Water is destructive of any metal system and care must be taken to reduce the possibility of a casing-leak.

A finished pipeline can never be stronger than its weakest link; for this reason pipe which is to be covered with insulation must receive an even, fully protective finish. The most-used type of insulation is the tar-paper combination; here a tar mixture at a temperature of about 300°F. is poured onto the exterior and a wrapping is immediately placed around the entire pipe. This whole operation is accomplished with uniformity and rapidity by a single machine. The machine is a self-propelled unit with a self-heating trailer to move the pipe along, apply the tar and then wrap it, all in a single operation. Some of the largest machines for this purpose can apply tar and paper at a rate of 800 ft. per hour.

The lengths of pipe sections being laid vary from about 40 ft. to 120 ft. These sections must be welded, fusing the steel walls of the sections together as one piece. So that the pipe will not be stressed by bending, each section must be in a nearly level position when the welding is being performed. To attain this, a floating crane is used to lift pipe sections onto wooden assembly ramps where they are welded together and also to the end of the pipe already laid from the shore.

X-ray pictures of the completed joint welds are checked to make cer-

Job Outlook For Engineers

The great social and economic changes experienced by this country in the past seventy years have been caused mainly by technological developments. The engineer has been the leader of this change, and the growth of the engineering profession has been more rapid than that of most occupational fields.

The need for technically trained men was greatly increased during the years of World War Two, and the post-war reconversion, research, development, and construction work kept the demand at an all time high. The fact that so few men were trained during the war years further increased the demand. The United States Department of Labor predicts that the number of jobs in engineering may increase by as many as 100,000 in the next decade.

The large numbers now enrolled in engineering schools, however, indicate that many graduates in the next four or five years will be unable to find jobs in their chosen fields. In 1950, for example, it is predicted that there will be 17,000 to 18,000 jobs available in the profession, but there will be about 47,000 men graduated from the nation's engineering colleges.

The most serious oversupply is in the electrical engineering branch. The high level of activity in the building trades industry and the desire to use the many recent chemical discoveries has kept the demand for civil and chemical engineers high. There is an increasing demand in all branches for men having graduate degrees, the trend being most pronounced in the chemical and electrical industries.

The increasing competitive situation should not deter those students of real aptitude or with a realistic interest in engineering. Certainly engineering graduates will find that their future progress will depend mostly upon their individual ability and initiative.

F. G.

tain there are no defects in the joints. Defects in welds are rare, but no chances can be taken on pipe laid in water. After the welds have been x-rayed and covered with a somastic (asphalt, aggregate, and asbestos) coating, the crane lifts the welded line free of the ramp, and the ramp barges are pulled away before the crane lowers the completed section into the water. The procedure is repeated as the floating assembly line continues across the water. The protective somastic coating applied over a welded joint area is inspected for possible cavities with an electronic detector to eliminate any possible pinhole leaks which may have escaped visual detection.

To make an empty pipeline stay on the bottom of a river is not always easy. Lines have been known to rise to the surface when air was pumped through for cleaning purposes. To solve this a coating of dense concrete is sprayed on the exterior of the pipe. The concrete also makes a good protective coating, but the desired increase in weight in turn necessitates heavier pipe-laying barges and equipment. Concrete is used for protection from the many forms of marine life —mainly marine borers, which can cut through ordinary types of covering, exposing the pipe to possible corrosion.

A serious cause of casing holes is electrolytic action. Since the pipe traverses various strata of dissimilar materials, it acts as a conductor for currents generated by galvanic action if it becomes exposed. When the current generated by contact between the pipe and its surroundings leaves the casing to return to the earth, it erodes the casing form from the outside by removing iron from it in the same manner that an electroplating machine removes metal from one electrode and deposits it on another. This type of current is known to exist because it has been measured by lowering electrodes into a pipe that was insulated only partially from stray currents. It seems that the degree of localization at the point of departure of the current from the casing may be of more import than the amount of current flowing. For instance, in one line in South Texas carrying as much as 2 amp. current, there was relatively little damage; others with less than 0.1 amp. have developed holes. Since one amp. of current operating over a year at full efficiency is capable of removing 23 lbs. of iron from a string of casing, it is apparent that the action, if present, is dangerous even if the efficiency is low.

Because of the damage to the pipeline which may result from galvanic action, considerable care must be taken in the choice of the route of the line; mainly, swampy areas or those with poor drainage must be avoided. The water not only accelerates deterioration of any protective coating, but also acts as a catalyst to the reaction once it has begun. Heavy damage may occur especially rapidly in waters which have a high concentration of metal, such as the wash water from a coal or an ore mine.

It has been only rather recently that a practical method of combatting galvanic action was developed. Engineers evolved a method of attaching magnesium blocks to the line at intervals of about 10 miles. These magnesium blocks are usually about four feet long and about twenty square inches in cross section. The blocks are placed in the ground and, when attached to the pipeline by connection wires, will send the flow of current from the ground to the pipe, instead of from the pipe to the ground.

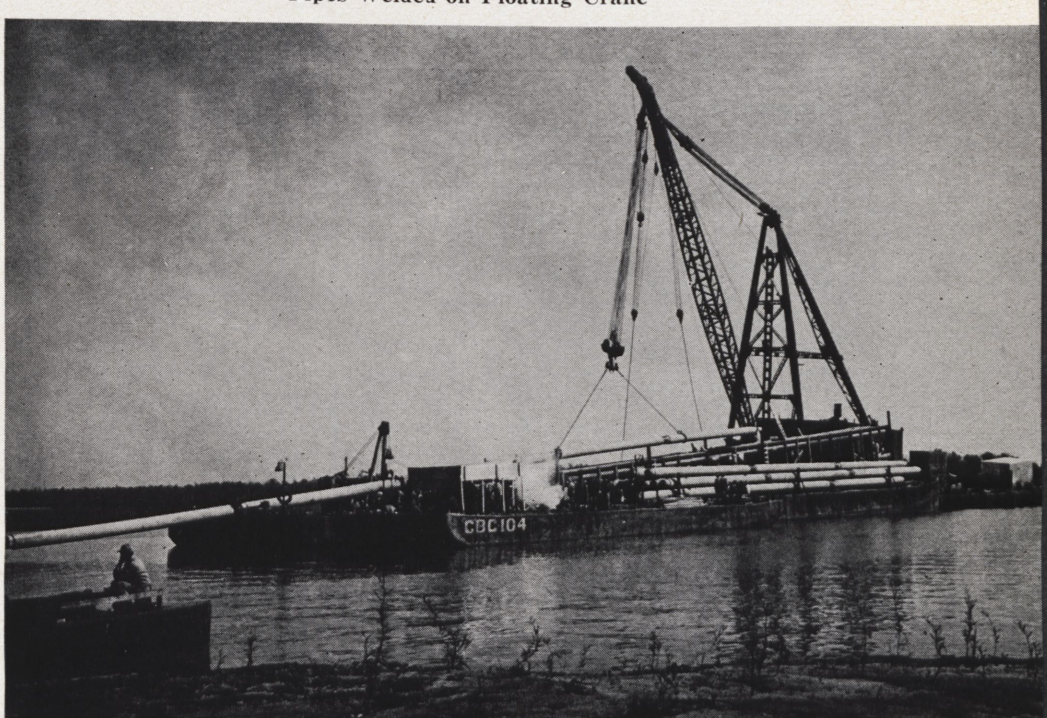
For installations using this method of avoiding galvanic action, is is customary to leave the pipe uncovered; hence a depositing of the mineral composition of the surrounding strata onto the pipe's surface will result.

In order to insure a secure and solid foundation for pipe which is being laid across a river, "ditching" of the river bed is necessary. A river floor is not level, but is a series of dips and hills; hence a dredge must be used to cut level beds through this shifty underwater terrain. It is general practice to lay twin pipes across a river. The purpose of this is that if a flood ever succeeds in wrecking one of the lines, the chances are that the other will hold and service can be maintained. One of the ditches is bowed upstream, the other down, with an appreciable gap between. The lines are laid in this curved pattern so they will have enough slack to settle into any new cavities that may develop, for the profile of most river bottoms is continually shifting.

Riverweights or "collars" weighing nearly a ton each are sometimes used to hold the pipe in position as nearly as possible. The riverweights are employed primarily in instances in which the course of the pipe line has been de-watered, for half of the weights must be placed in the bottom of the trenches. The upper half of the collar is bolted on after the pipeline has been fitted into the formed groove of the lower half of the collar. When the collar has been tightened and checked, the trenches are removed and the water allowed to return to its normal course.

It is evident that underwater pipelines are an acid test for pipeline transportation. Thus far the most spectacular accomplishment in building underwater pipelines is "Operation Pluto", a system of twenty small-diameter lines laid under the English Channel to carry gasoline to Europe. Operation Pluto, The Big Inch, and other pipeline systems have served to make the world "pipeline conscious" and respectful of the pipeline builders.

Pipes Welded on Floating Crane



Research and Development

By George W. Eddy, sr., m.e. and Fritz Wheeler, fresh.

Tom Thumb Radio Tube

A "Tom Thumb" synthetic radio tube, about the size of a match head, may be the answer to the question of how to reduce the weight and size of airborne electronic equipment. Called a "fieldistor," the sub-miniature tube is now in the early stage of development.

Being only 1/90th the size of the present-day tube, the "fieldistor" offers tremendous advantages from a weight and space standpoint—an all important factor in aircraft equipment. In appearance, it resembles the end of an eye dropper. Ten of them could be carried in an ordinary thimble.

Possible adaptation of the small tube to civilian usage is seen in such items as radio, television, hearing aids, fire and burglar alarms, thermostats, etc.

The "fieldistor" is still in the process of development. About 250 have been made to date, by hand, and the cost is too high for the average pocket book. With mass production methods, however, the cost should come to a reasonable price.

The small size and structure of the "fieldistors" will also enable them to better withstand engine vibration, gunfire, and landing shock which literally shakes the life out of the conventional tube. Since modern aircraft use hundreds of tubes, the space and weight saved by use of the "Tom Thumb" devices, plus their greater resistance to abuse, means longer aircraft ranges at reduced operating costs.

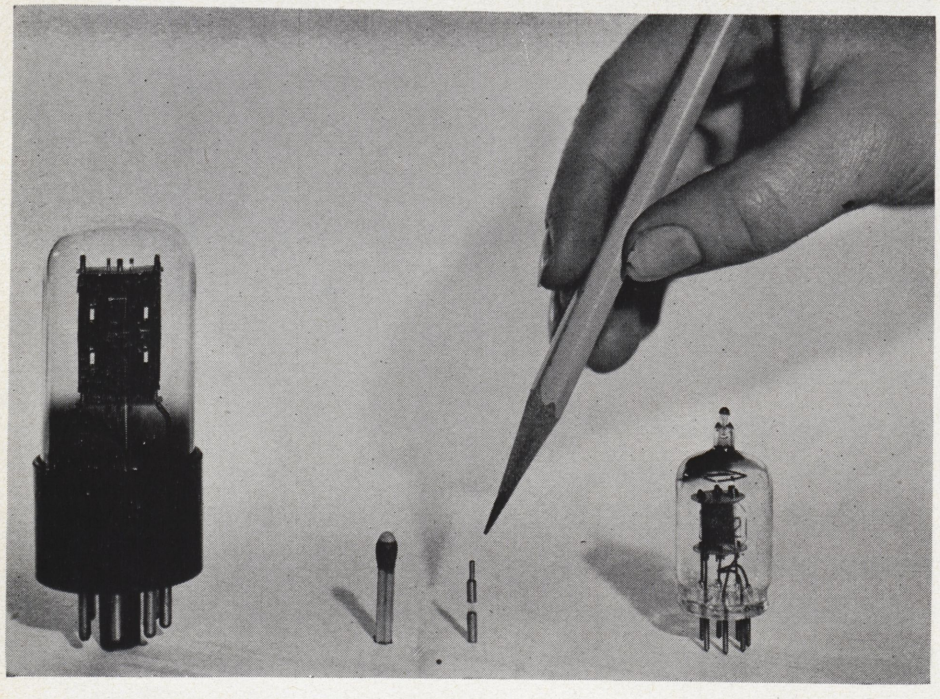
Another big advantage of the new "tube" is that it uses so little current that most batteries can be eliminated.

Rust-inhibiting De-icing Salt

More than one hundred cities and towns scattered through the snow belt plan to use the new rust-inhibiting chemical "Banox" with de-icing salt in clearing streets and highways for traffic this winter.

Highway departments are adopting the new material, which has been hailed as the solution to a vexing public works problem. Motorists like ice-free roads, but fear the possible corrosive effects of salt on their fenders.

The Synthetic Radio Tube



Cast Iron That Bends

Cast iron which is so ductible it can be bent, twisted, and otherwise deformed without fracture, and which has several times the strength of ordinary gray iron can now be produced. Many metallurgists believe the most outstanding foundry development since the American type of malleable iron was made in 1820.

"Ductible cast iron" has outstanding strength as well as ductility, in addition to exceptional resistance to shock, and is especially useful throughout the industrial world. Automotive, agricultural implement, machinery, petroleum, railroad and scores of other industries are applying it to hundreds of uses.

Ductile cast iron is a high carbon ferrous product containing graphite in the form of spheroids. Gray cast iron is a relatively weak and brittle material because its graphite is in the form of flakes which form a multitude of notches and discontinuities in the metallic matrix. Compacting the graphite in the form of spheroids reduces internal notching to a minimum and greatly increases the proportion of effective matrix structure.

An example of one of the best uses of the new material is the production of complex shapes to high mechanical properties. There are many parts of modern machinery which are too intricate to be cast in steel and which have inadequate properties when cast in gray iron.

A Shortage of Iron?

By Robert Ray, fresh.

There are few persons living in the United States today who are not aware of the tremendous importance of steel to industry. Most of us also know that steel is obtained by smelting iron and that iron is found in ores at various places in the eaarth's crust. Some had heard the rumors exchanged by men of industry that within the next few decades, not only the steel industry but the whole economy of our country might be seriously crippled by the impending shortage of available iron ore.

Iron ore, as used today in our blast furnaces, is found chiefly in great beds within mining distance of the earth's surface. The iron content of the ore in some of these beds has been made relatively high by nature through a chemical decomposition known as leaching. Through leaching the iron is separated to some extent from the silicates with which it is usually found.

Probably the best example of such a bed is the Hull-Rust-Mahoning open pit mine on the Mesabi Range at Hibbin, Minnesota—the largest pit in the world under mining operations today. This mine, which is said to compare with Grand Canyon in size, has for the last half-century supplied the United States with the iron ore it needed for its tremendous growth.

During each of the four war years, the annual yield of the Hull-Rust-Hahoning pit averaged about 25 million tons. However, in 1946 the annual output was only 16 million tons, and there has been a drop of about 2 million tons each year since.

This drop was caused partly by peacetime production demands, which are lower than those during a war. However, the production cuts are due mostly to the fact that the Hull-Rust-Mahoning mine has passed its peak in output of hematite, a relatively pure ore which is about 51% iron. This is what causes economists and the heads of industry to worry since the steel industry depends on the Lake Superior Region for two-thirds of its iron ore.

The industrialists are aware that sources of iron ore the world over, which are not in immediate danger of depletion, can supply the United States. But they do not want to rely upon foreign countries for our iron ore. In time of emergency, especially of war, this could mean a serious, if not fatal injury to our well-being. But how will the 45 to 50 million tons coming each year from the Lake Superior district be supplanted within our borders? Perhaps the question has been answered on the very range whose sources are fast dwindling away.

In 1948 a small plant at Aurora, Minnesota on the Mesabi Range, began producing magnetite and hematite, two oxides of iron, from taconite, a hard iron-bearing rock. The process is known as beneficiation and the company which in financing the enterprise is Pickands, Mather and Company, an indirect subsidiary of Bethlehem Steel Corporation. Estimates running to billions of tons of taconite have been made for the Lake Superior region and Upper Michigan.

However the rock is only 25 to 35% pure—as compared with the 51% average of Mesabi hematite—and cannot be used in the blast furnaces as it is mined. The taconite must first be crushed to a fine degree and the waste or gangue separated from the ores with which it is intimately mixed.

The first step is to grind the taconite to the texture of finest cement, so that it will pass through a number 325 mesh screen. The iron oxides are then separated from the gangue by one of two methods. Magnetite has certain magnetic properties and may be attracted by magnets away from the gangue. Hematite is non-magnetic and must be separated from the gangue by a process known as froth-flotation. A soapy substance is bubbled through the powdered rock in the presence of water; the hematite particles cling to the bubbles, while the heavier waste products sink below the surface of the water.

The concentrate when dried is much too fine for shipment and must be agglomerated (made into larger chunks) so that it will stay put in open cars, ore boat holds, and blast furnaces. The ore is pressed into pellets five-eighths inches in diameter and when heated, becomes porous so that it is suitable for charging blast furnaces.

The plant at Aurora, a 1.7 million dollar enterprise, has a smaller capacity than that which would bring top efficiency and economy. The 10 to 25 million dollar plants that ore men have planned for the future, should the plant at Aurora prove successful, will turn out more than a million tons of ore a year.

In addition to merely testing methods of beneficiation, the plant at Aurora will give the first real information on processing costs and the amount of capital investments required for large scale production. The plant will provide enough concentrate to be tried in blast furnaces, and will test different types of equipment devised for the process.

H. W. Graham, of Jones and Laughlin Steel Corporation, has hinted that research may develop a chemical means of beneficiation to surpass the method now in use.

Of the new ore fields under development, perhaps the most promising is the area in Northern Canada comprised of a section of northern Quebec and most of the western part of Labrador. It is estimated that within a decade, 20 million tons of ore will be pouring into this country from the Labrador tract with 15 million tons in addition from two beneficiation projects on the field.

In December of 1949, a group of American and Canadian ore companies and five United States steel companies signed an agreement concerning the new field. Hollinger-Hanna, Ltd., which conducted most of the exploration, agreed to manage mining operations for a fee of ten cents a ton.

Construction will not begin for a year, after which time ten million tons a year will be mined for the first five years, with an increase to twenty million tons a year for every year thereafter. It is estimated that there are available 300 million tons of ore, much of it above 60% in iron content, compared with the 51% iron content of Mesabi ore being shipped today.

The enterprise will necessitate the construction of a railroad from the mines to the port of Seven Islands, 360 miles to the south on the St.

Concluded on Page 18

Alumni News

Allen Junker, sr., m.e.
Cris Scharpenberg, soph.

'88 The first Heminway Medal, which was awarded to the late Edward G. Waters, has been returned to Rose by Mrs. Waters. The medal will be suitably framed and given a prominent place on the walls of the new library. It is hoped that the professional record and outstanding achievements of this pioneer in the electrical industry will be an inspiration to future generations of Rose men.

'95 Francis H. Miller, 75, died at his home in Louisville, Kentucky, March 25, 1950. He had been in ill health for the past several months.

Mr. Miller served as president of the Louisville Railway Company from 1931 until two years ago, when he became Chairman of the Board of that company. He had been with the organization since 1895, when it was in the process of changing from mule cars to electric power.

Mr. Miller graduated with a Bachelor of Science degree in Electrical Engineering. In 1897 he earned an M.S. followed by E.E. in 1899 and M.E. in 1914.

Survivors include his widow, four daughters, and one brother. Services were held in Louisville, Kentucky, March 27, 1950.

'14 Word has been received that Roy D. Moore died during February, 1950. At the time of Mr. Moore's death, he was in retirement. His last position was that of dairyman.

'21 Homer A. Clark was recently promoted to the position of principal of Redford High School, Detroit Michigan. He formerly held the position of assistant principal.

'24 Henry A. Scharpenberg died February 13, 1950, after a brief illness. At the time of his death he was a consulting engineer for Standard Oil of California.

Mr. Scharpenberg was born at Girard, Illinois. He graduated from high school at Bakersfield, California, in 1920 and then entered Rose. Five years after graduating from Rose, Mr. Scharpenberg married Miss Esther Kelson and they had two sons, Chris, who is attending Rose, and William, who is attending Bakersfield High.

His first position was with the city of Los Angeles as city Engineer. He then joined Standard Oil and in a short time became Maintenance Foreman for the Kettleman-Hills division. In 1945, after a severe illness, he was transferred to Taft, California, where he remained until his death.

During Mr. Scharpenberg's life, his main interest was with youth and he served many years as a scoutmaster. As evidence of his devotion to young people, he requested before his death that all donations for flowers be put in a trust fund for the benefit of the Boy Scouts of America.

He was a Mason, a member of Theta Xi fraternity and a member of the First Baptist Church of Bakersfield.

Cincinnati Rose Tech Club Reactivated

Louis Lyon '35 was elected President and Walter Zehnder '40 was elected Secretary-Treasurer at a recent meeting of the Cincy Rose Tech Club. Dr. Wilkinson, who attended the meeting, gave a short talk on the present and future plans of Rose, after which there was a long discussion period in which each of the sixteen alumni present took part.

'38 Clemen W. Lundgren, who has been with the firm of the Northern Indiana Public Service Company since 1939, was recently promoted to the newly-created position of Assistant to the Manager. During World War II he served with the Ordinance division of the Army and was discharged with the rank of Major. Mr. Lundgren now makes his residence in Gary, Indiana.

'43 The Technic offers congratulations to Robert E. Miller who was married to Miss Ethel Louise Heffernan of Hot Springs, New Mexico, on December 21, 1949.

'44 A son was born to proud parents, Mr. and Mrs. Arlis Hief on November 28, 1949. At the present the Hiefs reside at 726 Clara Ave., St. Louis, Missouri.

'44 A son, Gregory Allen, was born November 28, 1949, to Mr. and Mrs. Arlis J. Hief of St. Louis, Missouri.

'47 Robert A. Weinhardt Jr. received his M.B.A. degree from the Wharton Graduate Division of the University of Pennsylvania in June 1949. He has accepted a position with the Toledo Scale company and will serve as an engineer with the Sterling division at Rochester, New York, for six months; eventually he will work in the sales department. Bob's mechanical ability was brought to light recently in a picture featured by a November issue of Look magazine where he was in the act of assembling a door lock in a Production

Concluded on Page 20

Campus Survey

By James R. Myers, soph., Duane Pyle, soph., Allen Forsaith, soph., and David Spencer, soph.

St. Pat's Day Activities

Where were you when the grease hit the fan? That's what the greencaps wanted to know on St. Pat's Day. The festivities started off with a basketball game. It was a battle all the way but the Freshmen managed to nose out the Sophomores by a score of 36 to 34.

The next event was the tug-o-war. This was supposed to be the best two out of three trials, but only one was completed. It seems the old question of what happens when an irresistible force meets an immovable object was answered — the rope broke. Looks like the Blue Key underestimated the combined forces of the Freshmen and Sophomores in promising the Military Department that nothing would happen to their rope.

The main event was the flag race. The Sophomores securely fastened the flag to the top of the pole with about a pound of nails and then left a small part of it flapping in the breeze. The Freshmen stole this before the fight began, so even if they had have been able to climb the pole, they would have run into considerable difficulty in getting the flag. During the ten minutes of fighting, the Freshmen's main object was to drag out as many Sophomores as possible, while the Sophomore's main line of defense was smearing the Freshmen's faces with mud and grease. After the fight was over the Sophomores laked Charles Hirchfield, mainly to open laking season.

The day was climaxed by the annual St. Pat's Dance. Leo Baxter did a fine job of providing music for the affair. The beard growing prizes were awarded by Jim Gaston, president of Blue Key. For the best beard, Arthur Ebeling came in first and Niel Gochenour second. For the most unusual beard, Tom Grinslade won first prize and Bill Atto took second. These men were presented with shaving mugs. Myron Hawk, who won the prize for the most feeble attempt, was presented with a bottle of hair restorer. Vernon Salzman was presented with a special award because he allowed his girl to talk him into shaving. The prize was a toy, egg-laying chicken.

Distinguished Speaker At Opening of Auditorium

The new auditorium is now officially open. Hanson Baldwin, military editor of the New York Times, addressed the student body in the new auditorium March 28, thus marking the long awaited official opening of the Rose "blue room." An evening program at eight was presented for the public. Because of a limited seating capacity, tickets were made available to the public without charge. Contributors to the building fund were extended invitations to the opening. The program is the first of a series of public presentations to be sponsored by Rose.

Mr. Baldwin was introduced by Professor Maclean, who noted that both Mr. Baldwin and President Wilkinson are Annapolis graduates. Mr. Baldwin has had a long career as a military analyst and won the Pulitzer Prize for reporting naval action in the South Pacific. His subject in the afternoon was "The U.S. versus Russia" and in the evening, "Security in the Atomic Age."

A. I. Ch. E.

At the close of last term the Rose chapter of A. I. Ch. E. held an election. The new officers are as follows: Don Springman, president; Paul Haas, vice president; Wayne Seegers, treasurer; Jack Oberle, secretary. The chapter now has one hundred percent membership.

The Chemical basketball team finished second in the intramural league after being beaten by both the freshman A and B teams and ending the season with a respectable 6-2 record.

A campaign for more activities has begun with the entrance of the new officers. A few weeks ago a trip was taken to the Commercial Solvents Corporation. The penicillin plant in particular was visited during the afternoon. Next week a trip is in line for the Champagne Velvet Brewery. A full turnout is anticipated for this trip. Motion pictures of various processes and industries are being ordered to be used during the regular Thursday meetings.

A new office equipped with desk, typewriter, and file cabinet is now the property of the society.

Campus Capers

Doctor Sousley, the whistler, entered his calculus class the morning of St. Pat's day in a fine humor. He jokingly remarked that he'd give five points on the final examination to any student who'd let him work on his beard. There were a few beard growing contestants present. Gene Hailstone was on his feet immediately ready to make a deal. Somewhat surprised, "Doc" whipped out of the

Concluded on Page 20

The Battle Rages

Self-Satisfied Sophomores

Fraternity Notes

Theta Xi

The brothers of Kappa chapter have been very busy for the past few weeks. After the trip to Indiana University for the basketball tourney, plans were immediately begun for the rush program with an attempt being made to include a touch of spring house cleaning here and there.

Kappa chapter has been awarded the pleasure and privilege of initiating and installing a new chapter at the University of Kentucky. This was accomplished by some very hard work by some of the brothers with the aid of the alumni chapter in Louisville.

Kappa extends its deepest sympathy to Chris Scharpenberg, whose father passed away a few weeks ago. Mr. Scharpenberg was an alumnus of Rose and Theta Xi.

A party is being planned for the very near future in conjunction with the policy of bettering relations with Indiana State—the sororities that is. This is to be followed up by a stag party which will be in line with the Theta Xi prohibitionist movement—to destroy all alcoholic beverages in the world, by drinking them up of course.

Lambda Chi Alpha

Two new men were initiated into the fold of Lambda Chi Alpha this month, these new brothers being Mark Broemmelsiek and Allen Stiles. A new pledge, Bob Delp, was also welcomed at the last meeting.

Many improvements have been made in the house lately. An automatic hot water heater was installed, and a large double drainboard sink was bought for the newly decorated kitchen. These new fixtures and the painting of several rooms were the first improvements in the primary spring housecleaning.

Brothers Tom Norman and Leo Little attended a meeting of social chairmen in Indianapolis March 18. They made a report of the conference to Bill Chambers, Theta Kappa's social chairman, who has done a good job in improving our social affairs. The first of our exchange parties with State sororities was held recently, with our Zeta being the guests of the Kappa's. A return engagement is now being planned.

All the members of Lambda Chi wish to congratulate Brother Ray Summerlot and his recent bride, the former Miss Naomi Lynch, who were married March 24.

A welcome visitor at the house was Brother Bill Gordon, who graduated last February and is now working for the Cook County Road Commission in Chicago.

Sigma Nu

The house took on a new look lately, when the downstairs furniture was reupholstered and the shower room retiled. As spring housecleaning got under way, several men took it upon themselves to carpet their rooms, clean wallpaper, scrub woodwork, and in general initiate spring cleaning.

Under the planning of Bill Gray, our social chairman, Beta Upsilon has been very active in social affairs and many more are foreseen for the future. A pledge dance is to be held for the new pledges and plans are also underway for the Starlight Dance, which is to be held in May. The dance, an annual affair, will be held on the tennis courts.

The Saturday night dinners which we have been giving recently have been a rousing success. The candlelight dinners have been complete to the last detail. Brothers Tom Leathers and Hank Bosch have taken the role of the white-jacketed bus boys, while Andy Hallden has provided dinner music on the piano. Along with the actives and pledges and their wives and dates, many guests have attended. The dinners have been given to increase our contacts and also to improve the chapter.

Beta Upsilon wishes to welcome Mr. Carson Bennett, the new school librarian, to Rose. Mr. Bennett is a Sigma Nu alumnus of Epsilon Mu chapter at Butler University, Indianapolis. Prior to his arrival at Rose, Mr. Bennett was circulation librarian at Alabama Polytechnic Institute.

The Sigma Nu bowling team has still refused to surrender the league lead. Although we recently dropped three games, we are still holding a slim three game margin.

New scintillation counter, using electron tube developed at RCA Laboratories, gives faster, more accurate measurements of atomic radiations.

What can you hear through an ***ear of grain*** *?*

When agriculturists want to learn what nourishment a plant is getting, they inject radioactive materials into the soil and trace their absorption with sensitive instruments. Industry and medicine also use this ingenious technique to gain needed knowledge.

Until recently, scientists literally *heard* what was happening, for they followed the passage of atomic materials through plants or machines, or even the human body, with a clicking Geiger counter. Now a more sensitive instrument—*a new scintillation counter* made possible by a development of RCA Laboratories—can do the job more efficiently.

Heart of this counter is a new multiplier phototube, so sensitive that it can react to the light of a firefly 250 feet away! In the scintillation counter, tiny flashes, set off by the impact of atomic particles on a fluorescent crystal, are converted into pulses of electrical current and multiplied as much as a million times by this tube.

* * *

See the newest advances in radio, television, and electronic science at RCA Exhibition Hall, 36 West 49th Street, New York. Admission is free. Radio Corporation of America, Radio City, N. Y.

Continue your education with pay—at RCA

Graduate Electrical Engineers: RCA Victor—one of the world's foremost manufacturers of radio and electronic products—offers you opportunity to gain valuable, well-rounded training and experience at a good salary with opportunities for advancement. Here are only five of the many projects which offer unusual promise:

- Development and design of radio receivers (including broadcast, short wave and FM circuits, television, and phonograph combinations).
- Advanced development and design of AM and FM broadcast transmitters, R-F induction heating, mobile communications equipment, relay systems.
- Design of component parts such as coils, loudspeakers, capacitors.
- Development and design of new recording and producing methods.
- Design of receiving, power, cathode ray, gas and photo tubes.

Write today to National Recruiting Division, RCA Victor, Camden, New Jersey.

Also many opportunities for Mechanical and Chemical Engineers and Physicists.

RADIO CORPORATION of AMERICA

World Leader in Radio—First in Television

GREAT MEN OF SCIENCE

Wilhelm C. Roentgen

By Stanley Updike, soph.

The success of many great men has come through their hobbies and in the case of Dr. Wilhelm Conrad Roentgen this was true. It was through his interest in amature photography that the world was endowed with one of the greatest developments that medicine has known.

It was in the fall of 1895 that Roentgen first become aware of the power of x-rays. He was in his office at the University of Wurtzburg studying cathode rays and, being an excellent glass blower, he blew his own tubes. His desk was cluttered with an assortment of tubes, a book, which contained a flat key for a marker, and under the book some unexposed photographic plates.

Dr. Roentgen was working with a crookes tube which was blown in the shape of an S with electrodes at either end. Being very absorbed in his work he had as usual forgotten to eat lunch. His wife Bertha however had not forgotten and summoned him away from his work. Laying the still-glowing crookes tube on his desk he left the room.

After eating, Dr. Roentgen took a few photographic exposures and among the plates he used were the ones that had been lying under the book on his desk. Upon development the shadow of a key appeared on the negatives. This puzzled Roentgen and he began to retrace events to find where this could have come from. It did not take long for him to find what had happened but why it happened was a puzzling question.

To check his beliefs Roentgen reenacted what had happened before, leaving the plates exposed for the same amount of time. The same results took place; there on the photographs was the shadow of the key. Now it was known that cathode rays would effect photographic plates but could they pass through the book and leave the shadow of the key? It was to fantastic to believe so.

It was late on the night of November 8, 1895 when Roentgen decided to perform further experiments with these strange cathode rays. Carefully he set up his apparatus and covered his vacuum tube with black paper. As he closed the switch sending a high tension through the tube a strange glow appeared in the room. It was some crystals of barium platinocyanide on a nearby table which had started glowing. His first conclusion was that these rays were passing through the opaque paper and exciting the crystals, but this seemed so impossible that even he doubted it.

After six weeks further work he was finally convinced and began a paper entitled "Preliminary Communication on a New Kind of Ray", which was published December 28, 1895. Scientists all over the world now started to study "Roentgen Rays" and a new era in science began.

At the age of 30 he was appointed professor of mathematics and physics in Wurttemburg but returned to Strassburg the following year. Three years later he received a commission to the University of Giessen where he spent the next nine years. He then became the head of the Physics Department of the University of Wurzburg.

In 1901 Roentgen received the first Nobel prize in physics ever to be awarded.

In 1919 his wife died and left him alone and sad, for their marriage was a long and happy one. In 1923 he died, ironically enough, of cancer, a disease which today is being treated by his great discovery, x-ray.

THE DU PONT DIGEST

With the development of Neoprene Type W

Science Again Outpoints Nature

Motor mountings, wire and cable, sponge, gaskets, swim caps are among possible uses for Du Pont's new Neoprene Type W.

NEOPRENE — the chloroprene rubber produced by Du Pont research—has long outpointed natural rubber on many counts. Because of its greater resistance to chemicals, flame, heat, sunlight, weathering, oxidation, oils, grease and abrasion, it is widely used in such products as industrial hose, conveyor and transmission belts, insulated wire and cable, hospital sheeting, gloves and automotive parts.

Until recently, however, certain natural rubber compositions couldn't be beaten when it came to "permanent set" characteristics. Released from the pressure of prolonged deformation, they returned more nearly to their original shape.

This recovery factor is important to some manufacturers, particularly the people who make gaskets, seals, diaphragms, sheet packing, soft rolls and vibration-dampening devices.

NEW PRODUCT NEEDED

Much as they wanted to use neoprene because of its other superiorities, they often needed more resistance to permanent deformation than it afforded. So they used natural rubber, but were never quite satisfied with the way it resisted deterioration in severe service.

Du Pont scientists went to work to solve the problem. Skilled research chemists, physicists, engineers and others pooled their efforts. The result was a new polymer named Neoprene Type W.

NEOPRENE TYPE W INTRODUCED

Chemically, the new neoprene is quite similar to previous types. But its molecular structure has been changed so that the mechanical properties of its compositions are more nearly like those of rubber. With Neoprene Type W, it is possible to producevibration-dampeningdevices that are not only highly resistant to oils, heat, grease and sunlight, but recover better than rubber from prolonged pressure.

Jackson Laboratory, Deepwater, N. J., one of Du Pont's laboratories which participated in the development of Neoprene Type W.

Neoprene Type W also provides the basis for compositions that have a low modulus of elasticity—are easy to stretch. More attractive colors are possible. Soon it may appear in such articles as swim caps, where bright colors and head comfort are important. The brighter-colored compositions should also appeal to makers of appliance cords, coasters, sink mats, stove mats and toys.

In developing the uses of Neoprene Type W, Du Pont is working with hundreds of manufacturers and distributors. Once again a "partnership" of big and small businesses will cooperate to give Americans the benefits of an advance in science.

★ ★ ★

SEND FOR "The Story of Coal, Air and Water," a 28-page illustrated booklet describing the chemical ingenuity behind the development of neoprene, nylon, and other products. For your free copy, write to the Du Pont Company, 2503 Nemours Bldg., Wilmington, Delaware.

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Great Dramatic Entertainment—Tune in "Cavalcade of America" Tuesday Nights, NBC Coast to Coast

A Shortage of Iron?

Concluded From Page 11

Lawrence River, as well as terminal and port facilities at Seven Islands.

Two ways of hauling the ore from Seven Islands to the factories within the United States are under consideration. The favored route would mean a haul down the St. Lawrence and the Great Lakes by ore boat to the mills at Cleveland, Chicago, and Detroit—a short rail distance from Pittsburgh and Youngstown. An alternate method would be to ship the ore coastwise to Atlantic ports and haul the ore inland by rail. The former is favored because of the eight to one ratio of rail and waterway transportation costs.

The total cost of the enterprise will be between 150 and 200 million dollars, half of which the customer steel companies have agreed to furnish. In time of war, the probability of losing this source of iron would cause little concern, due to our long-standing friendly relations with Canada.

A second source of iron ore recently undergoing mining operations is the magic mountain Caue, commonly known as Mt. Itabira, in Brazil. For two centuries, Brazil has known of the iron resources she possessed in Itabira, but not until World War II did Dictator Vargas nationalize both the mountain and the 375-mile railway extending from the mines to the port of Vitoria. Government subsidizations and private investments totaled 15 million dollars and the United States Export-Import Bank subscribed to 19 million dollars. The Rio Doce Valley Company was formed to administer both the mine and the railway.

The top 300 feet of the mountain were found to contain "compact hematite," the best iron ore there is—68% in purity and comparable to Sweden's finest ore. Below the mountain's top was a layer of "Canga" ore, ranging from 54% in purity, and a layer of "Irabirite"—from 45 to 52% in purity.

In 1948, 27 million dollars more was subscribed and new machinery purchased. Electric shovels, compressed-air drills, and crushing plants were introduced; improvements on the railroad and port facilities were made. The goal of Itabira's yearly output has been set at 1.5 million tons, and will soon be realized.

A third mining enterprise, due to come into the picture some time this year, is the 20,000-acre concession granted to Bethlehem Steel's subsidiary, Iron Mines Company, which centers around Venezuelt's rich iron source, Mt. El Pao.

In 1941 a great engineering feat was begun by Gahagen Construction Corporation of New York when the dense jungle surrounding the mountain was first attacked. Today El Pao is a thriving community connected by rail to Palua, a port 36 miles to the north on the Orinoco River.

The ore—ranging up to 72% in purity—is mined at El Pao by huge electric shovels, then crushed on its way to the foot of the mountain where it is loaded into railroad cars. Hauled by Diesel locomotive to Palua, it is dumped from a viaduct into underground ore bins. On a conveyor belt, located beneath the bins, the ore is carried to ore barges. After a 36 hour ride down the Orinoco, the ore reaches Puerto do Hierro where another great engineering undertaking is nearing completion. Since 1947, this port has undergone a change from little more than a sandy beach to a port that will handle 24,000 ton ocean-going vessels, bound for the United States.

When Puerto Hierro gets under way, it will be able to transship some two million tons of ore annually.

It is easy to see then that although output at the world's iron-mining center, the Mesabi Range, is declining, plans are already underway to insure the tremendous amount of iron ore necessary to the economy of the United States. With 20 million tons of high-grade iron ore pouring in from Labrador annually plus 15 million tons of beneficiated ore from the same area, and with at least 5 million tons of beneficiated ore from Mesabi (with a much greater yearly tonnage possible) in addition to four to five million tons from Brazil's Itabira and Venezuela's El Pao, there need be no fear about running short of iron ore.

Public Opinion—
NOTHING IS STRONGER
. . . given the facts
NOTHING IS WISER

On the Owners of Business

A "community" estimated at some 14,000,000 people owns American business. The Bell Telephone system is owned by 940,000 stockholders. General Motors is owned by 436,000, Pennsylvania Railroad by more than 202,000.

* * *

There are more stockholders in the U. S. than there are farmers. More than the membership of the CIO. More than the membership of the A.F.L. Certainly stockholders are no "privileged few."

* * *

67,000 more stockholders now have a share in General Electric's ownership than 15 years ago. There are 80,000 more owners of General Electric than there are employees. Today's total of stockholders is over 250,000. Of these, more than 215,000 are individuals.

65,000 General Electric employees are participating in a plan which encourages savings. Investment in U. S. Savings Bonds gives them a bonus of G-E stock for bonds held five years.

* * *

Compared with the boom year of 1929, American businesses have collectively increased their payments to their stockholders by 45%, and their tax payments to government by 678%.

* * *

Anything that injures the owners of business directly injures 14 million people. It destroys the provisions that they have tried to make through their own efforts for security. Anything that injures the security of these 14 million people also injures the security of those who rely on invested capital for the tools and jobs they need to make a living.

You can put your confidence in—

GENERAL ELECTRIC

Concluded From Page 13

room leaving his students in a puzzled state. In two or three minutes he returned, bringing with him a large roll of scotch tape. Tearing off long strips, he started covering Hailstone's face. The job almost completed, "Doc" taped up Gene's mouth with the remark, "Now, maybe you won't ask so many questions." Doctor Sousley was later heard mumbling, "I wish I'd had a pot of glue."

Survey Scraps

Big wheels and little cogs are turning on the Handbook and Modulus staffs. The Handbook staff is faced with a difficult problem: how to make the Freshman Handbook water and grease proof.

Tau Beta Pi is planning another student-faculty debate in the near future. Student debaters are easily procurable but the faculty seems reluctant to let its well groomed hair down.

Representatives from the Detroit Edison Company, the U.S. Rubber Company, and the Firestone Tire and Rubber Company were at Rose during March to conduct senior interviews. Mr. James Campbell, '36, represented the Detroit Edison Company.

The Hamilton, Ohio, plant of the Lima-Hamilton Corporation was recently host to another Diesel engine educational symposium, sponsored by the Diesel Engine Manufacturers Association. Irvin P. Hooper represented Rose in the group of twenty-two professors and instructors who attended the all-day session.

In the future, Campus Survey will attempt to run one short item in every issue concerning a humorous incident occurring in, around, or within laking distance of the R.P.I. salt mines. Such incidents must, of necessity, be contributed by members of the student body. Students having any information which might promote a snicker are requested and urged to button-hole a staff member and elaborate. Contributor's names will be withheld if the information is of an incriminating nature. These incidents will be printed under the heading Campus Capers.

Indiana Central Edges Rose 61-43

Rose Poly's fleetfooted trackmen dropped their second meet of the season, March 23, to a well balanced Indiana Central team. Taking four firsts and five seconds in the individual events and splitting the relays, Rose managed to keep in the running until Central swept the shot put thus eliminating any chance of a Rose victory.

The small crowd that came to watch a rapidly improving Rose team saw several marks raised. Gene Hailstone, Rose's vaulting sophomore, soared to 11' 9" the best height of his track career. Harry "Fuzzy" Badger, pride of the frosh, contributed five points to the cause by clearing the high jump bar at 6'-0 his best height to date. "Rapid Robert" Failing, showing his usual form, broke the tape in the 440 after a spirited race with Sanders of Central.

Rose came up with its only 1-2 combination in track events when Bohrman and Wright won the high hurdles. The sprint relay team of Ennis, Hailstone, Mook, and Haswell brought home the bacon after a very fine exhibition of baton passing.

Harry Badger led the Rose team with eight points while Harvey collected 10 for Central.

Basketball Team 1949-1950

ALUMNI NEWS

Concluded From Page 12

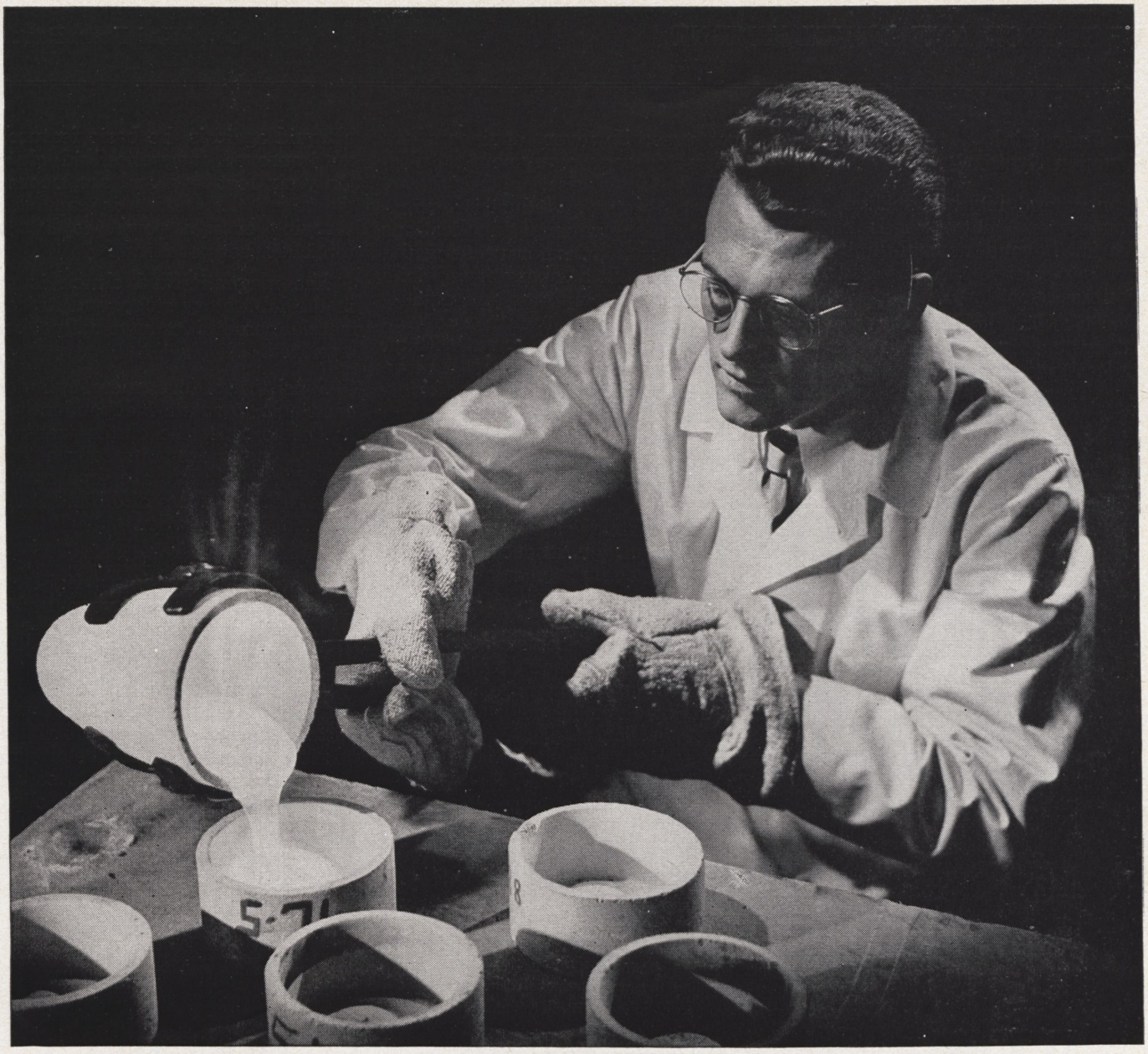
Methods class at the University of Pennsylvania.

'38 Edward H. Eckerman, a well-known member of the faculty, is at present a professor of Mechanical Engineering. He was born in Terre Haute thirty four years ago and attended State High School. After graduation he held a position with the Bell Telephone Company of Illinois for a few years then entered the Yale Graduate School. In 1943 he obtained a Master of Engineering degree, then returned to Rose where he has remained since.

Mr. Eckerman is a member of A.S.M.E., Tau Beta Pi, Blue Key and Sigma Xi fraternity. "Ed" says that he likes it here at Rose and plans to make teaching his life work.

'49 Bill Smock is now employed at the Allison Division of GMC in Indianapolis, Indiana. He was graduated with a B.S. degree in Electrical Engineering at Rose.

'49 A bouncing, eight pound girl, Linda Susan, was born to John G. and Mrs. Martis, February 28, 1950.



He uses 7/8 of the earth's elements in his cooking

If you've always thought of glass simply as a substance made of sand, soda, and lime, we believe this will surprise you:

Corning scientists, such as the one you see here cooking up a batch of experimental glass, *have actually made glass using 84 of the earth's presently known 96 elements.*

Nearly 3000 of these experimental glass compositions are turned out every year, as Corning scientists search for new and useful ways to combine nature's elements.

Already Corning has developed more than 50,000 formulas for glass. Just as alloys make metals more useful, these 50,000 formulas make glass more useful—enlarging its applications in untold and sometimes surprising ways.

Corning makes glass so strong that it can be used as piping in a steel mill. Corning makes glass so soft that it can be melted with a match—and glass so resistant to thermal shock that it can be heated to a cherry red, then plunged into ice water without its breaking.

Today, throughout industry, *Corning means research in glass*—research which, along with a multitude of other developments, has made glass one of today's most versatile engineering materials.

Corning is constantly turning up new kinds of glass, new uses for existing ones. So when you're out of college, and concerned with product or process improvement, it will pay you to call on Corning before your planning reaches the blueprint stage. *Corning Glass Works, Corning, New York.*

CORNING
means research in glass

Concluded From Page 10

New Industrial Television System

A new and highly effective television system that extends human sight far beyond normal limits for benefits to science, industry and education has been developed.

Described as the smallest and simplest system ever devised for non-broadcast, industrial television operations, the new system is based on a remarkably small and sensitive pick-up tube known as the Vidicon. The system consists solely of two units—a television camera approximating the size of a personal 16 millimeter movie camera and a master control monitor that con be carried as easily as a suitcase.

The Vidicon tube, less than a tenth of the size of the previously used image orthicon, is able to transmit black-and-white pictures at normal lighting levels and to attain a resolution of more than 500 lines. The system can be adapted to produce pictures in natural colors. Surveys have indicated that black-and-white pictures will meet the requirements in most uses; however, engineers are working on color equipment to fulfill needs that may arise.

A wide range of industrial, scientific and educational applications present possibilities for utilizing the new system. In a laboratory, details of dangerous operations and experiments are brought closer to observers without endangering life, but with an increase in efficiency through more precise control. One man at the monitor may watch a number of indicators on widely separated equipments in order properly to synchronize operations or the regulate processing and output.

Industrial television offers further usefulness in the inspection of the interior of cylinders, cannon bores and tanks, as well as oil-well casings, actory chimneys and grain elevators. In addition, it may be used to observe conditions in urnaces, destruction tests or to analyze combustion products of jet engines and rockets.

Magnetic-Fluid Clutch

A liquid which can instantly change to a solid and then return to a liquid again is the basic feature of an improved magnetic-fluid clutch. Only six feet long and six inches in diameter, the device is capable of carrying enough power to lift one ton 1,000 feet per minute.

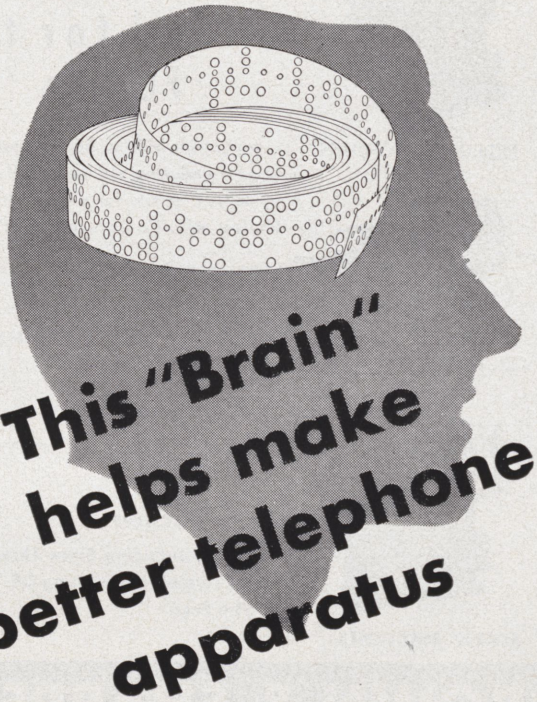
The magnetic-fluid clutch is still in the laboratory stage, and its commercial possibilities have not yet been explored.

Consisting of three metal cylinders, each able to rotate independently on the same axis, the clutch transmits rotary power from its source to its load. The cylinders are separated by a magnetic mixture of oil and finely-divided iron powder.

When the unit is energized, the fluid solidifies, making a rigid connection between the two cylinders, so that as one cylinder revolves, its motion is transmitted to the other.

Power can be applied to the load and removed from it easily by the clutch operator. Degrees of rigidity of the magnetic fluid can be obtained by regulating the current, so that the clutch can be made to slip if necessary.

Newsworthy Notes for Engineers



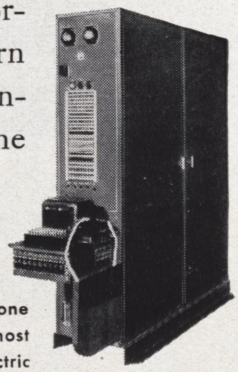
This "Brain" helps make better telephone apparatus

To improve the accuracy of testing Bell telephone switching equipment and to speed up tests during manufacture, Western Electric engineers designed and built a unique test set—known as the Tape-O-Matic—which has a paper tape "brain."

Controlled by a narrow paper tape, punched with coded information, the machine *automatically* performs complicated series of tests. If there is a fault in the equipment under test, the Tape-O-Matic stops, rings a bell and indicates the source of trouble on a lighted panel.

Some 1200 different tapes, varying in length from one to thirty feet, are used for testing various assemblies. Formerly an operator, in testing an average size assembly, had to make 41 individual connections. With the Tape-O-Matic, one multiple plug connection does the job. And 28 preliminary tests, 81 lamp observations and 71 key operations are replaced by one tape insertion and the push of a button.

The Tape-O-Matic can cut testing time as much as 80%—practically eliminates the possibility of human error—and helps to assure equipment of highest quality. It is a good example of the ingenuity, skill and thoroughness which Western Electric engineers put into making Bell telephone equipment.



The 1500-pound Tape-O-Matic is one of the largest, most complex and most versatile test sets that Western Electric engineers have ever devised.

Western Electric

A UNIT OF THE BELL SYSTEM SINCE 1882

Engineering problems are many and varied at Western Electric, where manufacturing telephone equipment for the Bell System is the primary job. Engineers of many kinds—electrical, mechanical, industrial, chemical, metallurgical—are constantly working to devise and improve machines and processes for production of highest quality communications equipment.

Six million electric ranges. 37 million radios. 29 million electric clocks. 27 million electric refrigerators. 17 million electric coffee makers. 23 million toasters... *Thirty years ago, they were just a sparkle in someone's eye.*

Facts like that should hearten you, when you wonder about your future in American industry. The opportunity's there—as it was there for Alcoa in the early days of electrical transmission.

Today, nearly half the high-tension lines that feed those appliances are made of Alcoa Aluminum. Nearly two million miles of ACSR (aluminum cable steel reinforced). Although it was light, and corrosion resistant, and conductive, nobody wanted to make aluminum into cable, at the beginning. All right, we said—we'd do it. We launched a long research project to produce purer metal, and made the basic changes in our reduction processes that the research finally indicated. We built a cable-testing laboratory long enough to mount whole spans of cable, and vibrate them as the wind does, to check fatigue strength. This was hard, discouraging work, and it took most of the lifetimes of a good many Alcoa people.

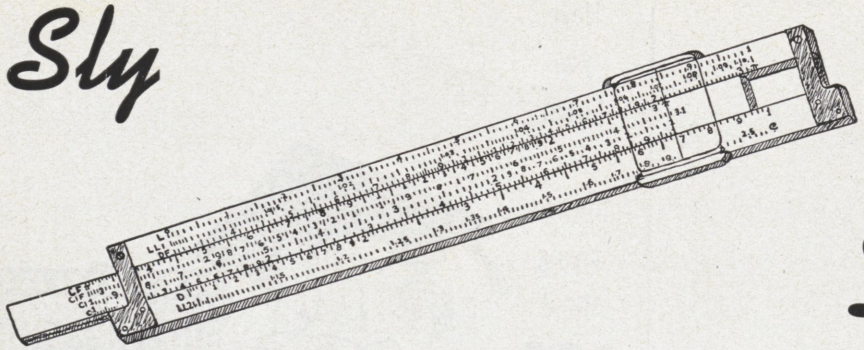
But today aluminum high-lines cross the Great Bear in Canada, and funnel Grand Coulee's power into millions of homes and factories. We think they stand as a pretty good monument to this country's way of doing things, through research perseverance, stockholders' courage, and employees' hard work. ALUMINUM COMPANY OF AMERICA, 742D Gulf Building, Pittsburgh 19, Penna.

ALCOA FIRST IN ALUMINUM

ALCOA ALUMINUM

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

Sly Droolings



By Denzil Hammond, sr., m.e.

A hen, hit by an army jeep, got up, straightened out her feathers and said: "Lively little cuss . . . but he didn't get anywhere.

* * * * *

He: "You're just like a sister to me.

She: "My God, what a homelife!"

* * * * *

ME: "How did you get your tongue so black?"

CE: "I dropped my bottle on a freshly tarred road."

* * * * *

"Lady, you'll have to pay full fare for that boy. He must be over twelve.

"How can he be over twelve, when I've only been married ten years?"

"Listen, lady, I collect fares — not confessions."

* * * * *

"Gimme a kiss like a good girl."

"All right, but if I give you one like a naughty girl you'll like it better."

* * * * *

"Oh, Marie, je t'adore."

"Shut it yourself. You opened it."

* * * * *

Give an athlete an inch and he'll take a foot. But let him take it. Who wants athlete's foot.

* * * * *

She was a good looking blonde and when her tire went flat she hailed a passing motorist. He stopped. "Wonder if you'd help a girl in trouble?" she inquired.

He said, "Sure, sister, what kind of trouble do you want to get into.

* * * * *

"Why are you wearing that toothbrush in your lapel?"

"That's my school pin; I went to Colgate."

* * * * *

An impetuous young man managed to negotiate a date with a pair of Siamese twins one night. "Have a good time?" asked his awe stricken friend later.

"Well," reported the young man, "yes and no."

The bride was extremely embarrassed when she saw twin beds in the hotel room.

"Why, what's the matter, darling?" asked the husband.

"I thought that we were supposed to have a room all to ourselves."

* * * * *

ME: I fainted. They brought me to, so I fainted again.

EE: Why?

ME: Well, they brought me two more.

* * * * *

Prof: "If in going down this incline, I gain four feet per second, what will be my condition at the end of five seconds?"

Junior: "You'll be a centipede."

* * * * *

And then there was the Scotchman who bought just one spur. He figured where one side of the horse went, the other was sure to follow.

* * * * *

Sobbing, she kissed him and boarded the train. The kindly conductor noticed her wedding ring and said: "There now, don't cry because you are leaving your husband. You'll see him again soon, I'm sure."

"I'm not leaving him," she cried through her tears: "I'm going to him!"

* * * * *

The ME instructor placed the chisel against the rusty bolt. He looked at the ME student and said, "When I nod my head, you hit it."

They're burying him tomorrow at noon.

* * * * *

Little Willie is so distressed, he got a pair of pink pajamas and a military hairbrush for Christmas and now he doesn't know whether to go to West Point or Harvard.

* * * * *

The reason that marriage is so popular is that it combines the ultimate in temptation with the maximum of opportunity.

A Los Angeles car owner was having his eyes tested for a driver's license. Pointing to the chart on the wall, the examining officer asked the man to identify the things that he saw.

"What is in the large circle in the center?" he asked.

"That is the figure 81," the man replied.

"Wrong," said the officer, "that is a picture of Mae West talking to Kathrine Hepburn."

* * * * *

A university is an institution with room for 2000 in the classrooms and 50,000 in the stadium.

* * * * *

It's much harder to appreciate the flower of womanhood when you can't see the stems.

* * * * *

Let me live in a house
A fraternity house
Where the brothers are bound by a tie;
Where one man's gin
Is another man's gin,
But hands off that quart of rye.

* * * * *

Joe: Why don't little devils eat ice cream cones?

Moe: I don't know.

Joe: Where in Hell would they get them?

* * * * *

Did you hear about the artist's model who wasn't in the nude for her work?

* * * * *

Both women and pianos are of the same brand,
Some are upright and others are grand.

* * * * *

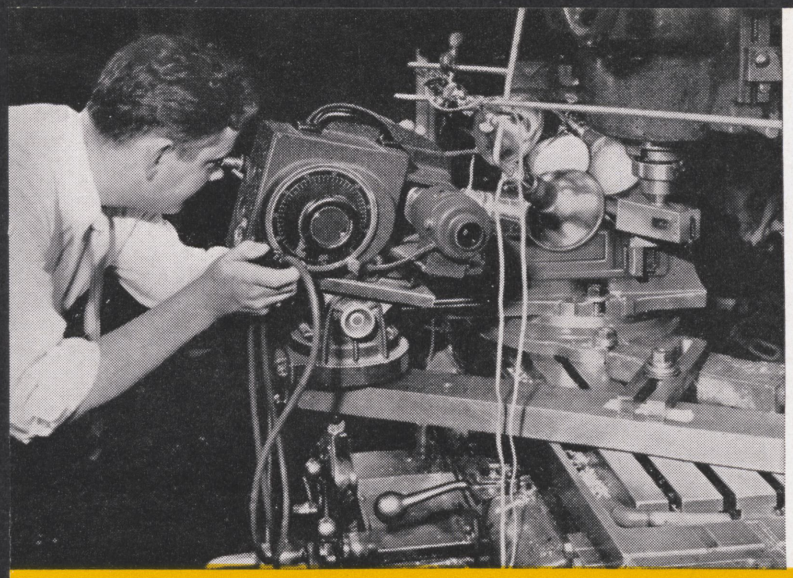
Old lady: My goodness, you don't smoke do you, little boy?

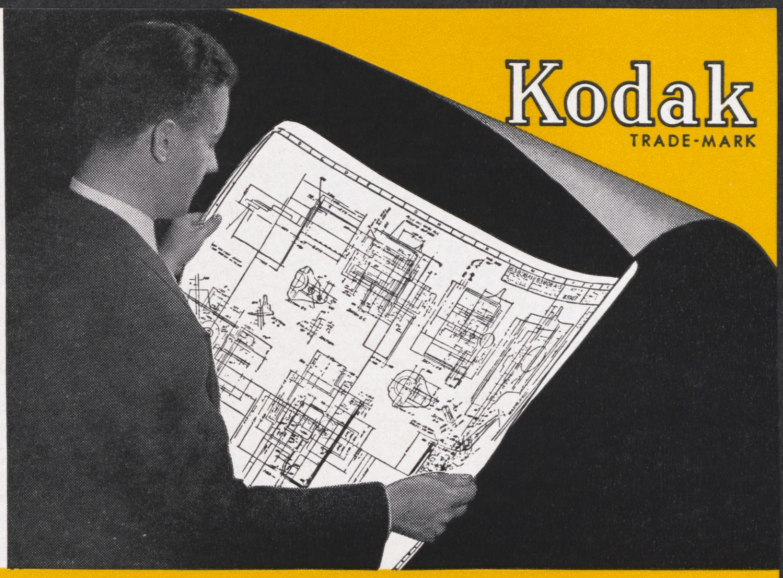
Little boy: No, mum, but I can give you a chew!"

* * * * *

Mother: Willie, why did you kick your little brother in the stomach?

Willie: It was his own fault; he turned around.





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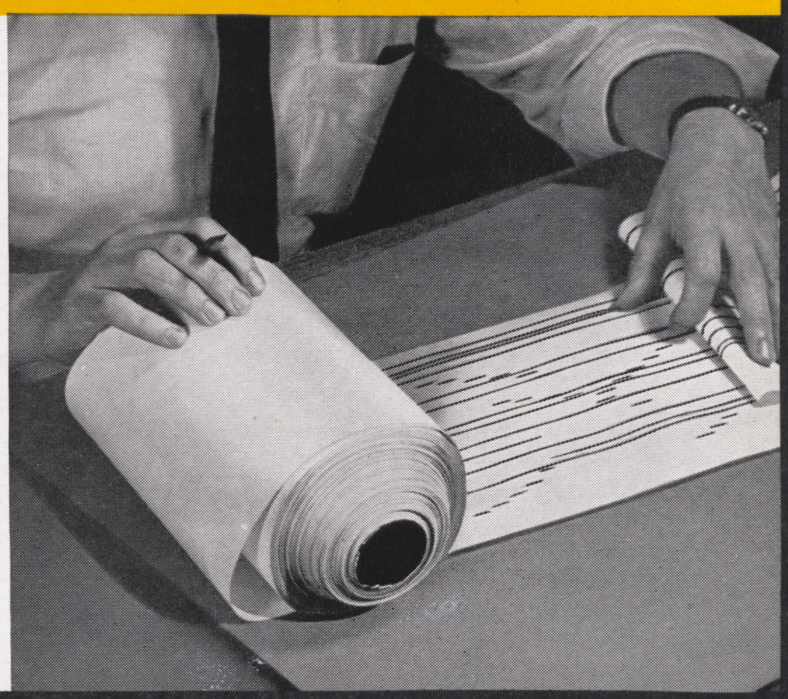

"Chesterfields are so Mild they leave a clean, fresh taste in my mouth."

Kirk Douglas

Starring in

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